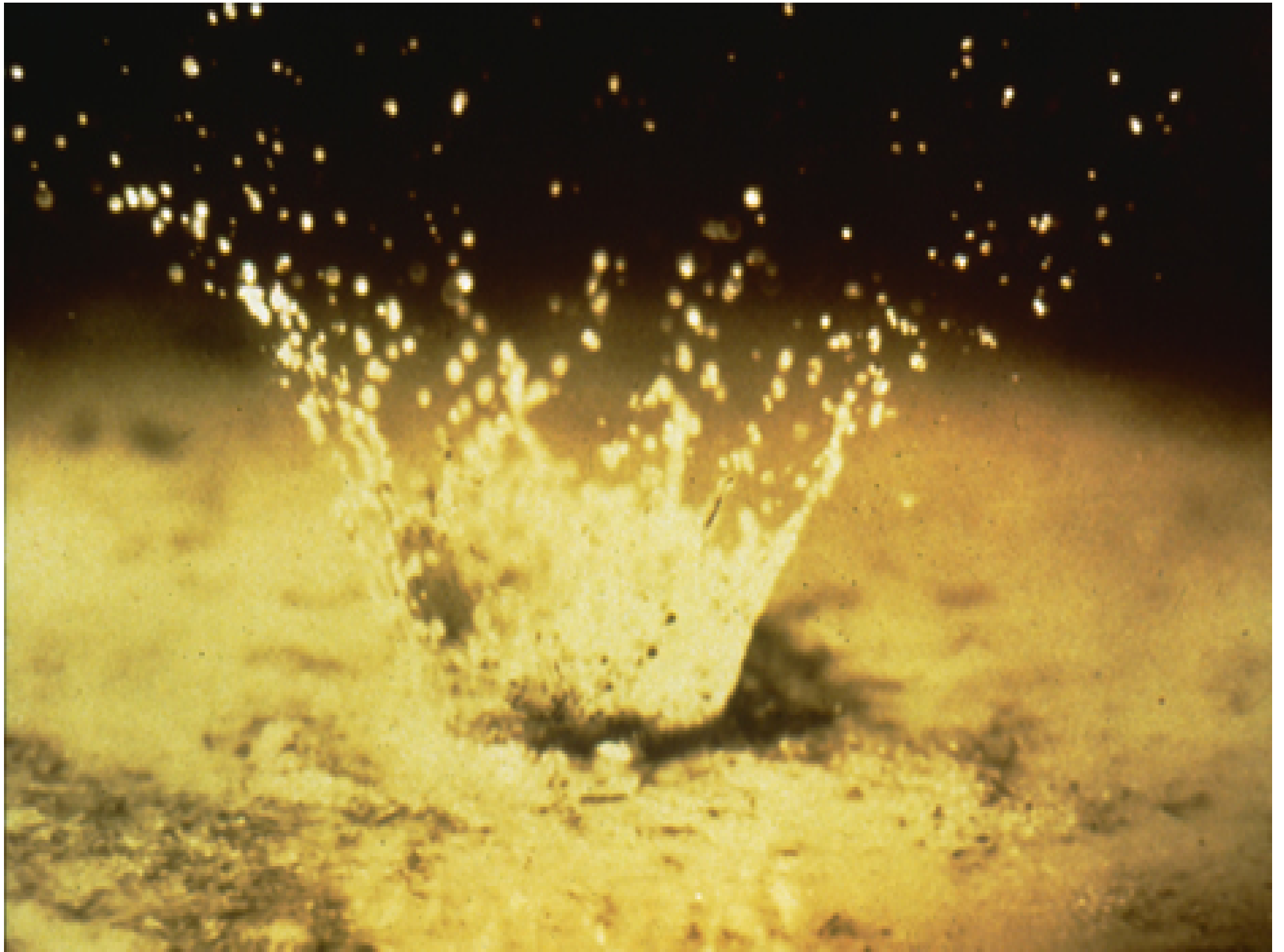


The New Erosion and Sediment Control Technical Standards

Pete Wood
WisDNR SE Region

Gil Layton
President NASECA Wisconsin
Layton Environmental /HNTB

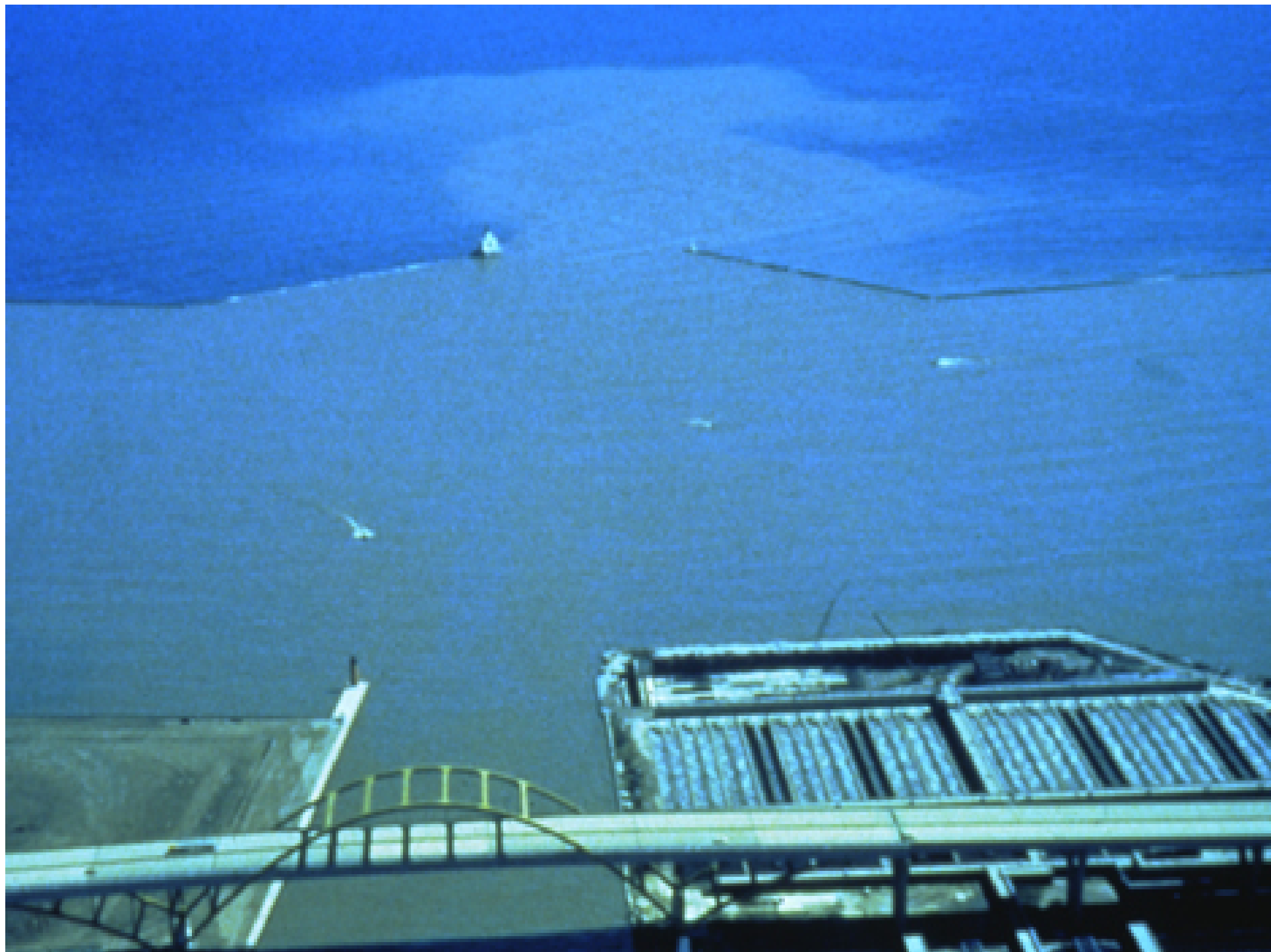


Erosion Control is Preventing Soil
Dislodgment in the First Place

Sediment Control is Stopping it's
Movement After it is Dislodged























The Importance of Planning



Erosion Control

Product Acceptability Lists for Multi-Modal Applications **PAL**



www.dot.wisconsin.gov/business/engrserv/pal.htm

New WisDNR Standards Require PAL Approved Products For All NR-216 Permitted Construction

- Effective 2005 construction season
- Covers ALL sites over 1 acre

Product Acceptability List (PAL)

- Erosion Mats
- Tackifiers
- Soil Stabilizers
- Inlet Protection
- 'FF' Fabrics
- Temporary Ditch Checks
- In-Stream Sediment Traps
- Articulated Concrete Block Systems (ACB's)

– All products ranked by performance

Devices Required On All Grading Projects (WisDOT FDM 10-10-1)

1. Temporary Seed
2. Permanent Seed
3. Fertilizer
4. Mulch
5. Erosion Mat
6. Temporary Ditch Checks (Erosion Bales)
7. Silt Fence
8. Mobilizations, Erosion Control
9. Mobilizations, Emergency Erosion Control
10. Soil Stabilizer, Type B (Polyacrylamide),

Benefits of PAL

- Ease of design
- Uniform performance within categories
- Toxicity testing where warranted
- Increased competition from suppliers
- Lower costs for clients / agencies

Channel and Slope Matrices

CHANNEL EROSION CONTROL MATRIX
(Concentrated Flow Application)

TYPE OF EROSION CONTROL DEVICE	PERMISSIBLE SHEAR LOSS P.	DITCH GRADE												REMARKS				
		≤ 1%			1% – 4%			4% – 8%			8% – 12% *				12% – 15% *			
		Max. Length (ft.)			Max. Length (ft.)			Max. Length (ft.)			Max. Length (ft.)				Max. Length (ft.)			
		300	600	1200	300	600	1200	300	600	1200	300	600	1200	300	600	1200		
Permanent seed with temporary seed and mulch	0.5	██████████															Overseed with temporary seed at one-half normal application rate.	
Sod ditch checks with seed and mulch	N/A	██████████			C												Install one ditch check for every 1 foot of drop. Sod stakes required.	
Temporary ditch checks (hay bales or approved manufactured alternatives listed in the WisDOT PAL)	N/A	██████████			██████████												Install one ditch check for every 2 feet of drop. Maximum 100' spacing.	
Sod ditch liner	1	██████████															Upstream and must be buried. Additional sod stakes required.	
Double netted light duty (WisDOT Class I Type B) erosion mat	1.5	██████████			██████████			██████████									Only mat type products allowed.	
Sod reinforced with a double netted tube (WisDOT Class II Type A) erosion mat	1.5	██████████			██████████												Upstream and must be buried. Additional sod stakes required. Two-bed items needed.	
Stone or rock ditch checks	N/A	██████████			██████████			██████████									Use No. 2 coarse aggregate, railroad ballast, or breaker run. Install one ditch check for every 2 feet of drop. Use in conjunction with a channel lining.	
Medium duty coconut erosion mat (WisDOT Class II Type B or C)	2	██████████			██████████			██████████			██████████							
Heavy duty synthetic (Class III Type A or B) erosion / turf reinforcement mat	3	██████████			██████████			██████████			██████████						Germination may be a problem with Class III Type A mats. Type A soil stabilizer is required for initial erosion protection.	
Heavy duty synthetic turf reinforcement (WisDOT Class III Type C) mat	3.5	██████████			██████████			██████████			██████████			██████████				A soil stabilizer is required for initial erosion protection. Contact manufacturer if higher shears are needed.
Riprap ditch checks	N/A	██████████			██████████			██████████			██████████			██████████				Place top of downstream ditch check level with bottom of upstream ditch checks. Use in conjunction with a channel lining.
Heavy duty synthetic turf reinforcement (Class III Type D) mat	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Riprap	4	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Medium riprap	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Heavy riprap	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Riprap measures apply to all ditch types. Use of these measures requires engineering judgement and design.																		

Riprap measures apply to all ditch types. Use of these measures requires engineering judgement and design.



<http://dnr.wi.gov/org/water/wm/nps/stormwater/techstds.htm>
or via <http://runoffinfo.uwex.edu> or
<http://dnr.wi.gov/org/water/permits/>

Construction Site Erosion & Sediment Control

(PDF, opens in new window)

STANDARD	Number	File Size (KB)	Effective Date
Channel Erosion Mat	1053	142	08/05
De-watering	1061		
Ditch Checks Figure 1 Figure 2	1062	498 333 32	08/05
Construction Site Diversion	1066	157	02/04
Dust Control	1068	125	03/04
Grading Practices for Erosion Control - Temporary	1067	131	03/04
Interim Sediment Control: Water Application of Polymers	1051	268	11/02
Land Application of Anionic Polyacrylamide	1050	615	07/01
Mulching for Construction Sites	1058	142	06/03
Non-channel Erosion Mat	1052	165	08/03
Rip Rap			
Sediment Bale Barrier	1055	136	08/03
Sediment Basin	1064		
Sediment Trap	1063	193	09/05
Seeding	1059	160	11/03
Silt Fence illustration - PDF illustration - DGN*	1056	228 90 79	09/03

Silt Curtain	1070	554	09/05
Stone Tracking Pad and Tire Washing	1057	108	08/03
Storm Drain Inlet Protection For Construction Sites illustration - PDF illustration - DGN*	1060	379 245 298	10/03
Turbidity Barriers	1069	1.4 MB zip	09/05
Vegetative Buffer for Construction Sites	1054	141	05/03

* in Zip file

Post-Construction Storm Water Management

STANDARD	Number	File Size (KB)	Effective Date	Tech Notes
Bioretention for Infiltration (includes drawings in Zip file)	1004	881	10/04	available
Compost	S100	90	10/04	
Infiltration Basin (includes drawings in Zip file)	1003	901	10/04	available
Infiltration Trench				
Rain Gardens: use "Rain Gardens: A how-to manual for homeowners" PDF format (exit DNR)			8/05	
Site Evaluation for Stormwater Infiltration *	1002	183	02/04	
Swales				
Wet Detention Pond	1001	27	09/99	

Downloadable in PDF format

Channel Erosion Mat (1053)

Wisconsin Department of Natural Resources
Conservation Practice Standard

I. Definition

A protective soil cover of straw, wood, coconut fiber or other suitable plant residue, or plastic fibers formed into a mat, usually with a plastic or biodegradable mesh on one or both sides. Erosion mats are rolled products available in many varieties and combination of materials and with varying life spans.

II. Purpose

The purpose of this practice is to protect the channel from erosion or act as turf reinforcement during and after the establishment of grass or other vegetation in a channel. This practice applies to both *Erosion Control Revegetative Mats (ECRM¹)* and *Turf-Reinforcement Mats (TRM)*.

III. Conditions Where Practice Applies

This standard applies where runoff channelizes in intermittent flow and vegetation is to be established. Some products may have limited applicability in projects adjacent to navigable

V. Criteria

This section establishes the minimum standards for design, installation and performance requirements. To complete the shear calculations, a 2 year, 24 hour storm event shall be used to calculate depth of flows for an ECRM. For sizing a TRM, use the depth of flow corresponding to the maximum design capacity of the channel.

Only mats listed in the Wisconsin Department of Transportation (WisDOT) Erosion Control Product Acceptability List (PAL) will be accepted for use in this standard.

To differentiate applications WisDOT organizes erosion mats into three classes of mats, which are further broken down into various Types.

A. **Class I:** A short-term duration (minimum of 6 months), light duty, organic ECRM with plastic or biodegradable netting.

1. **Type A** – Only suitable for slope


Seeding (1059)
Mulching (1058)

Seed and Temporary Seed with Mulch




Temporary Seed The Most Cost Effective BMP



A photograph of a grassy field with a line of trees in the background. The text "After 2 Weeks" is overlaid in the center.

After 2 Weeks



After 4 Weeks



SOD ??

SOD ??



Inlet Protection (1060)

Inlet Protection







Inlet Protection Wrong Way





Right Way



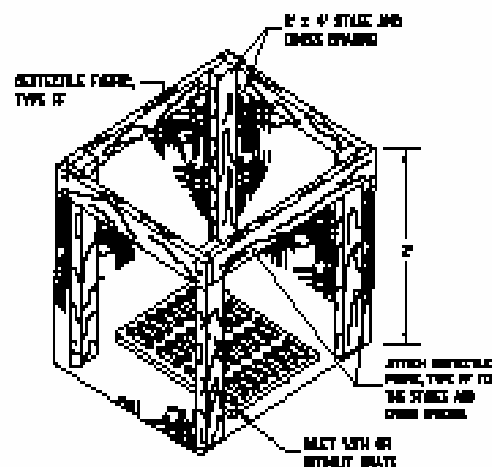
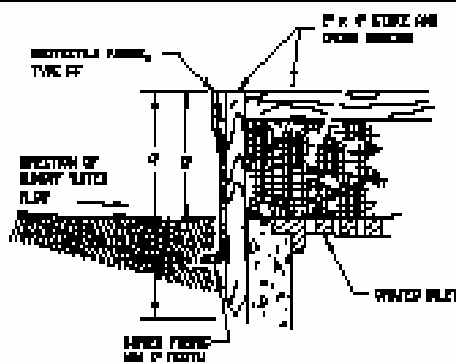
Improper Type C Inlet Protection (Silt Fence Fabric)



Proper Type C Inlet Protection







INLET PROTECTION, TYPE A

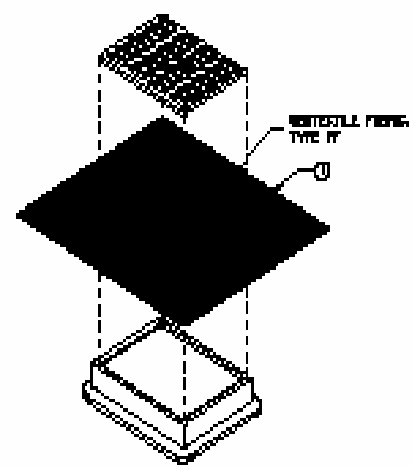
GENERAL NOTES

INLET PROTECTION COVERED SHALL BE MAINTAINED OR REPLACED AT THE DISCRETION OF THE OWNER.

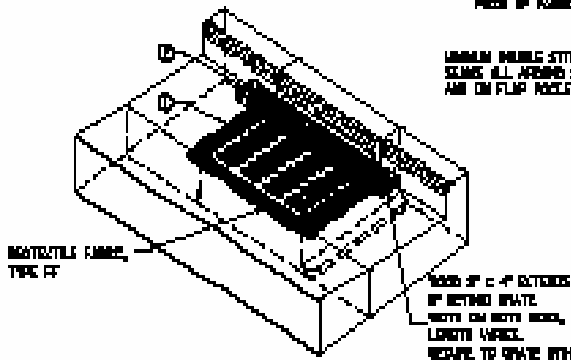
MANUFACTURER ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S DESIGN CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE PROTECTANT TRAPPED ON THE MESH FABRIC DOES NOT FALL INTO THE INLET, ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

- ① FINISHED SIDE WALLS AND FLAP ROCKET SHALL EXTEND A MINIMUM OF 10" ABOVE THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- ② FOR INLET PROTECTION, TYPE D WITH CLIMB INCH, AN ADDITIONAL 20" OF FABRIC IS TRAPPED BEHIND THE WOOD AND SECURED INTO STRUCTURE. THE TRAP SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE BURN BOX OPENING.
- ③ FLAP ROCKET SHALL BE LAYERED ENOUGH TO ACHIEVE 100% SEAL.



INLET PROTECTION, TYPE B (WITHOUT CORE BOX)
CAN BE INSTALLED IN ANY INLET WITHOUT A CORE BOX



INLET PROTECTION, TYPE C (WITH CORE BOX)

INSTALLATION NOTES

TYPE B & C

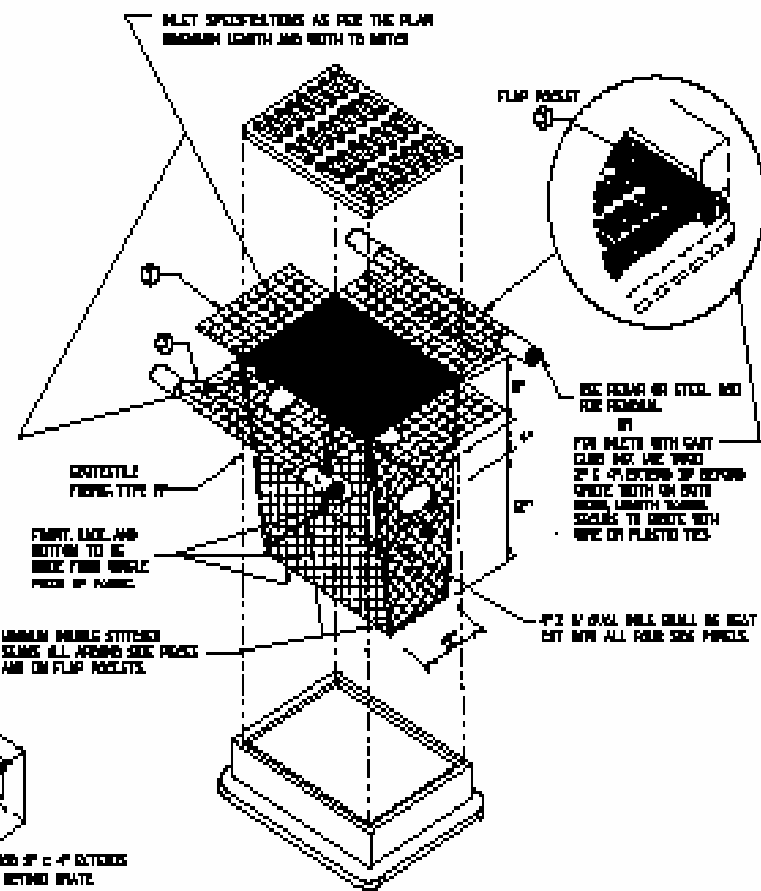
TRIM EXCESS FABRIC IN THE FLAM LINE TO WITHIN 2" OF THE GATE. THE CONTRACTOR SHALL DISSEMINATE A METHOD OF MAINTENANCE, LAMIN & BURN FLAM, WASH HOLES IN OTHER METHOD TO PREVENT INFLAMMABLE WASTE FROM ENTERING THE INLET.

TYPE B

DO NOT INSTALL INLET PROTECTION (TYPE B) IN INLET SMALLER THAN 10" MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE MATE.

TRIM EXCESS FABRIC IN THE FLAM LINE TO WITHIN 2" OF THE GATE.

THE INSTALLED BURN SHALL HAVE A MINIMUM 10" GAP BETWEEN BETWEEN THE INLET TRAILER AND THE BURN MEASURED AT THE BOTTOM OF THE OUTFLOW HOLES OF 3" WHERE NECESSARY THE CONTRACTOR SHALL OVER THE BURN BURN PLASTIC OF TIES, TO ACHIEVE THE 1" CLEARANCE THE TIES SHALL BE PLACED AT A MINIMUM OF 1" FROM THE BOTTOM OF THE BURN.



INLET PROTECTION, TYPE D

CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CLIMB BOX AS PER NOTE ①

INLET PROTECTION TYPE A, B, C, AND D	
STYLE OF INLET DISCRETION OF TRANSPORTATION	
APPROVED	
DATE	REVISIONS
FILE	